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## First record of larval sea lamprey *Petromyzon marinus* L. in the Endrick Water, Loch Lomond

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Three lamprey species are known to occur in Scotland: European river *Lampetra fluviatilis* and brook lamprey *L. planeri*, and the sea lamprey *Petromyzon marinus*. Although detailed records of their distribution remain scarce, lampreys have been sampled from 79 Scottish regions (ERA 2005). The sea lamprey is the rarest species in both records and surveys and has been recorded nationally in just 35 rivers, although their continuing presence in some is uncertain (ERA 2005).

The Endrick Water drains the South East catchment of Loch Lomond into its south basin. The river contains scientifically important populations of brook and river lamprey, and has been designated a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) as a result (Bond 2003; Hume 2011). Although several lamprey surveys have been conducted in recent years (Maitland et al. 1994; Gardiner et al. 1995; Gardiner & Stewart 1997, 1999; Forth Fisheries Foundation 2004; Hume 2011; Watt et al. 2011) adult sea lamprey have been recorded only very occasionally in the Endrick Water, and they have not been observed since the 1960s (Hunter et al. 1959; Maitland 1966). Spawning is believed to be restricted to the efferent River Leven between the barrage (NS 393 894) and footbridge (NS 394 793) in Balloch

(Maitland et al. 1994; Gardiner et al. 1995). Despite extensive sampling of larval habitat around the Loch Lomond basin in recent years, sea lamprey ammocoetes have until now only been recorded in the River Leven.

On March 21<sup>st</sup> 2012 a single sea lamprey ammocoete was collected immediately downstream of Drymen Bridge on the Endrick Water (NS 473 874) in static traps designed to capture adult lampreys on their upstream spawning migration. This individual measured 151 mm in total length and was 4.6 g wet weight. Positive identification as *Petromyzon* as opposed to *Lampetra* spp. was confirmed from the following meristic and morphometric characteristics (Fig. 1): trunk myomeres 71 (*P. marinus* 67-74; *Lampetra* spp. 58-64), oral hood fully pigmented (*Lampetra* spp. upper/lower lip unpigmented), caudal fin spade-like (*Lampetra* spp. typically rounded), robust head region (*Lampetra* spp. distinct pre-nostril region) (Renaud 2011). Sea lamprey larval duration is typically five years, although it can be as long as 19 years as growth rates vary enormously, so an accurate age estimate of just one individual is fraught with uncertainty. Based on typical values from other U.K. populations this individual is likely to be 3-5 years old, indicating that spawning took place in the Endrick Water at sometime between May/June 2007-2009 (Hardisty 1969; Bird et al. 1994).



Fig. 1. *P. marinus* ammocoete

Throughout Scotland larval *Petromyzon* are recorded in very low densities compared with *Lampetra* spp., even in rivers known to contain strong adult spawning populations (APEM 2004; ERA 2004; Watt et al. 2008). There remains the possibility that sea lamprey spawn in the Endrick Water in small numbers, but; that adults are not detected because trapping methodology excludes the larger body size of mature sea lamprey, and sea lamprey ammocoetes are not detected during routine surveys due to their inherent scarcity. Currently, the Endrick Water is a stronghold for lamprey in Scotland, with both *L. fluviatilis* and *L. planeri* populations being of international conservation importance (Bond 2003). If indeed this isolated record of larval *P. marinus* represents the first indication that

the species now maintains a spawning population within the Endrick Water, there is an implication that the conservation strategy for this river should be modified to include sea lamprey as a qualifying feature of the SAC.

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## A record of the aurochs, *Bos primigenius*, from Morayshire

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In May 2004 two horn cores attached to the frontal bone of a skull (Fig. 1) were discovered at the bottom of the main drainage ditch in the northeast corner of Ardgye Farm, three miles west of Elgin in Morayshire (Grid Reference NJ155638). These horn cores were recovered by Martin Bridges, the Moray Estates farm manager, and were sent to the National Museums Scotland for identification and conservation. Comparison with specimens in the NMS collection confirmed that the horn cores were from an aurochs, *Bos primigenius*. From their size and shape the horn cores were probably from a male. The left horn core measures 700 mm on the outside of the curve and 550 mm on the inside of the curve, whereas the right horn core measures 670 mm on the outside curve and 570 mm on the inside curve. The basal circumferences of the horn cores are 350 mm (right) and 340 mm (left). A bone sample was sent to SUERC, East Kilbride, where it yielded a radiocarbon date of 9690 ± 35 BP and a calibrated date of 11,120-11,260 BP (SUERC-20754). Calendar dates are increasingly underestimated by increasingly earlier radiocarbon dates (Lowe and Walker, 1997). This is because the amount of radiocarbon in the atmosphere has not been constant over time. Uncalibrated dates can be corrected using a calibration curve that is derived from samples that have been dated independently with other methods such as uranium time series, dendrochronology, varves and deep ocean sediment cores. The aurochs is widely recorded in Scotland and the rest of Britain. Yalden (1999) records 30 Scottish sites ranging from Orkney to Berwick in the south east and New Galloway in the south west. However, most records are from the Borders with a few in Perthshire. Therefore, these horn cores represent one of the most northerly records in Scotland.

There are few radiocarbon dates for aurochs in Scotland. Kitchener & Bonsall (1999) give five dates,